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ROCKY MOUNTAIN FOREST AND RANGE EXPERIMENT STATION

FOREST SERVICE

U. S. DEPARTMENT OF AGRICULTURE

FOREST INSECT CONDITIONS IN THE CENTRAL
ROCKY MOUNTAINS AND THE GREAT PLAINS, 1953

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INTRODUCTION

Forest insect conditions in the Central Rocky Mountains and the Great Plains during 1953 were what might be classed as normal. That is, there was a minimum number of serious epidemics and a general high level of endemic tree killing. It seems that this Region, where much undeveloped timber resource is surrounded by or intermixed with small to moderately large logging operations, is a region in which extremely variable insect conditions normally exist.

In late 1953 there was detected an epidemic infestation of Engelmann spruce beetle on the western end of the San Miguel Mountains in southwestern Colorado. This currently is the serious outbreak of two in the Region. In addition, there are scattered areas containing considerable numbers of ponderosa pine and Douglas-fir infested by the Black Hills and Douglas-fir beetles.

A summary of forest insect conditions in the Central Rocky Mountains and the Great Plains is reported annually by the Fort Collins Forest Insect and Disease Laboratory of the Rocky Mountain Forest and Range Experiment Station, Forest Service, U. S. Department of Agriculture. Forest insect conditions are determined by way of cooperative surveys, the results of which are assembled and analyzed by the Fort Collins Laboratory.

SURVEY RESULTS--GENERAL

Region-wide the forest insect conditions at the end of 1953 present much more than a maintenance problem because of two serious situations. First, the Uncompahgre-San Juan spruce beetle outbreak, and, secondly, the continuing epidemic of Black Hills beetle in ponderosa pine on the Uncompahgre National Forest. In both cases much valuable timber is being killed and more is threatened. Additional to these is the extensive killing of Douglas-fir by the Douglas-fir beetle on the San Juan National Forest. Although of economic concern, the Douglas-fir beetle situation is unattended due to lower priority because of the inaccessibility and smaller acreage involved. Otherwise, the insect situation is nearly endemic on all forests in the Region.

The present status of destructive forest insects is of current importance for immediate control planning; the potentiality of these same insects, however, must be considered in long-range plans, the particular objective being a combination of protection and prevention, perpetuity of endemic conditions.

Detection of forest insect infestations is usually a very difficult task. The unexpected and often unsuspected occurs. In August of 1953 the Uncompahgre-San Juan spruce beetle outbreak was discovered by a forest officer while traveling through the spruce on routine business. It developed from beetle-infested windfalls blown over during a storm in June 1950.

This detection of a spruce beetle outbreak is an example of discovery through chance, not design. It must be assumed that this outbreak is the only big one in the Region. The Region was "covered" during the year, mostly by foresters on other than insect survey business, thus the assumption that all large outbreaks were located and reported.

Forest insect detection is probably the most important phase of surveys. Detection is a real responsibility of all concerned with the forest--forest manager, woods operator, recreationist, and the public in general. It is repetition to state that more and better detection is needed. Reconnaissance and appraisal surveys, also, are on a restricted scale, not by design but by necessity. They are continuing to improve in numbers and in efficiency.

SURVEY RESULTS--SPECIFIC

Engelmann spruce beetle, *Dendroctonus engelmanni*, in Engelmann spruce

The "old" Engelmann spruce beetle outbreak on the White River, Routt, and Arapaho National Forests brought under control in 1952 is no longer a serious problem. As predicted and recommended, localized "hot-spots" were controlled in 1953 mostly on Red Table Mountain on the White River National Forest. Scattered trees were attacked again in 1953 and additional maintenance control work will be necessary during 1954. It may be that about 5,000 trees on the White River National Forest and 1,000 trees on the Arapaho National Forest will need treatment by a combination of chemical and trap-tree control methods. Some additional trap trees probably will be felled in 1954 to absorb beetles emerging in 1955 from scattered 1953-attacked trees. The need for additional trap trees will be determined after the 1954 survey data have been analyzed.

Surveys in 1953 were commenced in late July and were completed by mid-September. Most of the old outbreak area was covered and all serious "hot-spots" of 1953-attacks were treated as they were discovered. The treated trees were in the Sheephorn area of the Arapaho National Forest and on Red Table Mountain on the White River National Forest. Trap trees were felled where needed, in both areas, to absorb the 1954 flight from scattered 1952-attacked trees. Woodpecker and parasite activity was found to be strong in all areas of this "old" outbreak.

Early in September a detection report received by the Fort Collins Laboratory indicated that a small spruce beetle infestation might be present on the Norwood District of the Uncompahgre National Forest near Lone Cone. A survey crew was sent to the area and completed an appraisal survey of 59,436 acres of spruce by the first of November: A serious "new" outbreak of the Engelmann spruce beetle. Involved were two National Forests, the Uncompahgre and San Juan, with a grand total of 45,900 + 3,094 1952-attacked trees and 96,691 + 5,764 1953-attacked trees. As soon as the seriousness of the outbreak was recognized, control planning was commenced. A small portion of the 1952-attacked trees was treated and many of the main-haul insect control roads were constructed before winter weather closed all operations. It is estimated that in addition to the 1953-attacked trees, 125,427 1954-attacked trees will need attention in 1954.

The outbreak originated from scattered spruce which were broken and blown over during a June windstorm in 1950, windfalls which subsequently were attacked by beetles. Thousands of these trees were found by the survey crew, all containing old galleries of the Engelmann spruce beetle. Woodpecker activity appeared to be relatively heavy in fringe areas of the outbreak but sporadic within the main portions. Woodpecker populations are believed to be increasing within the outbreak area.

An infestation of the Engelmann spruce beetle in and around a logging operation on the Mancos District of the San Juan National Forest continues to be a puzzling problem. A sizeable control program was carried out during 1953, but many infested culls, stumps, slash, and some infested standing trees remain. The relatively few standing attacked green trees have been heavily woodpeckered. No additional control work will be recommended until observations have been made following the 1954 flight. A combination of trap trees and continued logging with an alteration from selective to clear cutting may greatly reduce the beetle spread from slash, stumps, and culls to standing green trees.

Only endemic levels of the spruce beetle are known to exist in other spruce stands in the Region.

Engelmann spruce beetle, *Dendroctonus engelmanni*, in lodgepole pine

As in previous years the number of lodgepole pine attacked by the spruce beetle was not recorded in the survey data. During 1953 very few lodgepole pines were attacked by the beetle. No cases of successful or full attacks were observed.

Black Hills beetle, *Dendroctonus ponderosae*, in ponderosa pine

The Black Hills beetle control project during the spring of 1953 on the Roosevelt National Forest was effective. The fall survey of 1953-attacks showed approximately a 4 to 1 reduction from the number of 1952-attacked trees. The infestation is now estimated to be 2,711 trees, mostly scattered in the treated areas. Control work has been recommended for the areas containing the most threatening infestations.

A cooperative control project was carried out in ponderosa pine stands on and adjoining the Bighorn National Forest. This project involved Forest Service, State of Wyoming, and private contributions. The pine in and around Story, Wyoming, and south to Sayles Creek was treated. Approximately a 4 to 1 reduction in beetle-attacked trees resulted. Although some infestation remains in the treated area the major epidemic stands are south of Sayles Creek. It is estimated that 1,900 trees are infested in the entire area.

Maintenance control was continued on the Black Hills and Harney National Forests during 1953. The estimate for 1954 control needs is 840 trees on the two Forests which were consolidated during 1953 into one, the Black Hills National Forest.

The Region's only serious Black Hills beetle epidemic is ^{on} the Norwood District of the Uncompahgre National Forest. Many of the trees are inaccessible, on steep canyon sides. Those on mesa tops are being logged. The estimate of

infested trees on the District and on the adjoining Miguel District is 4,700 trees. The infestation on the Miguel District consists mainly of scattered infested trees. The situation would probably be much more serious if some control work and logging had not been accomplished in 1953. This infestation involves some of the better pine producing sites in Colorado.

In other excellent pine sites on the San Juan National Forest tree killing by the Black Hills beetle has continued at a high endemic level. Although scattered, a large number of trees is involved; an estimate of 4,270 trees was attacked in 1953. Maintenance control is expensive but without maintenance control during the past several years a serious epidemic possibly now would exist.

An effective control project was carried out on the Conejos District of the Rio Grande National Forest. An estimated 100 trees should be treated during 1954 as a maintenance measure. Other trees are infested on the Forest but all these are widely scattered and many are inaccessible.

Small but potentially dangerous epidemic areas are present on the San Isabel National Forest. The estimate for the Forest is 1,700 trees, all in stands not treated during 1953. The 1953 control work was very successful where it was carried out and the treated stands are now at an endemic level of infestation.

An estimated 750 trees are infested on the Pike National Forest. These infestations involve areas on the South Platte, Bailey, and Pikes Peak Districts. The infestation on the Pikes Peak District borders a serious epidemic on private lands where an estimated 500 to 1,000 trees are infested. No control work should be done on the Forest Service land involved on this latter District unless a cooperative project to control the infestation on the adjoining private lands can be worked out with the State and private land owners.

On the Black Forest and Denver Mountain Parks areas in Colorado the Black Hills beetle is at an endemic level. A few scattered infested trees have been observed; where accessible these should be treated by the owners.

Douglas-fir beetle, *Dendroctonus pseudotsugae*, in Douglas-fir

The number of Douglas-fir trees infested by the Douglas-fir beetle remains at an endemic level on the Roosevelt National Forest and the Rocky Mountain National Park.

Tree killing by Douglas-fir beetles on the San Juan National Forest, however, has continued at a high level. The infested trees are in large groups in widely separated areas throughout most of the eastern half of the Forest. Most of the areas are inaccessible although some control through salvage logging is being done in one area near Pagosa Springs.

Turpentine beetle, *Dendroctonus valens*, in pine

Several trees killed by the turpentine beetle were found in the Black Forest area. All were on poor sites, mainly in dry, rocky pastures. Most of the trees were very weak before attack; very likely the insect attacks only hastened their death.

Spruce budworm, *Choristoneura fumiferana*, on Douglas-fir, fir, and spruce

Spruce budworm populations apparently remained at endemic levels in 1953 throughout the Region. This defoliator's potentialities are great and incipient outbreaks could be occurring in many areas; feeding was noted in widely scattered Douglas-fir stands.

Sawfly, *Neodiprion* sp., on pinyon

Damage to pinyon on the Colorado National Monument was practically nil in 1953. Some larvae were seen and some defoliation occurred, but, in general, a decrease was evident. On Mesa Verde an endemic situation continues.

Pinyon scale, *Matsucoccus acalyptus*, on pinyon

At the Colorado National Monument and the Mesa Verde National Park the pinyon scale appears to be increasing in severity. Additional research on control measures is needed.

Great Basin tent caterpillar, *Malacosoma fragilis*, on aspen

A severe epidemic of the Great Basin tent caterpillar continued and spread to additional areas of aspen in 1953. Tree mortality is occurring where the infestation has been continuous for several years. Complaints by recreationists and local residents have been very numerous. Thousands of acres are involved on private, State, and federal lands in southern Colorado.

Defoliation of bitterbrush, mountain mahogany, and serviceberry was severe on the Mesa Verde National Park. This situation is a continuing threat to the aesthetics of the Park.

Miscellaneous

Other forest insects occurred to a limited extent as in previous years. Some were more common than usual; others were less common; none was causing serious damage. Some of those frequently seen were: *Halisodota ingens*, tip moths, poplar and willow borers, a scrub oak defoliator, *Ips* spp., ponderosa twig moth, pine needle scale, and many of the wood borers.

Table 1.--Forest Insect Conditions in the Central Rocky Mountains and the Great Plains--1953

General Area	Insect	Host	Infestation Status
Colorado			
White River N.F.) Arapaho N.F.) Routt N.F.)	Engelmann spruce beetle	Engelmann spruce	6,000 trees + scattered
Rio Grande N.F.	Black Hills beetle	Ponderosa pine	100 trees + many scattered
	Great Basin tent caterpillar	Aspen	Heavy defoliation 15,000+ acres
San Juan N.F.	Engelmann spruce beetle	Engelmann spruce	41,598 trees--Rico District 50,000 culls, tops, etc.-- Mancos District
	Black Hills beetle	Ponderosa pine	4,270 trees
	Great Basin tent caterpillar	Aspen	Moderate to heavy defoliation, several thousand acres
	Douglas-fir beetle	Douglas-fir	Epidemic on eastern half of forest
Roosevelt N.F.	Black Hills beetle	Ponderosa pine	2,711 trees
Uncompahgre N.F.	Engelmann spruce beetle	Engelmann spruce	100,993 trees
	Black Hills beetle	Ponderosa pine	4,700 trees
San Isabel N.F.	Black Hills beetle	Ponderosa pine	1,700 trees
	Great Basin tent caterpillar	Aspen	Heavy defoliation 20,000+ acres
Pike N.F.	Black Hills beetle	Ponderosa pine	750 trees 500-1,000 trees on adjoining lands

Table 1.--Continued

General Area	Insect	Host	Infestation Status
Mesa Verde N.P.	Great Basin tent caterpillar	Bitterbrush, mountain mahogany, and service-berry	Widespread defoliation
	Oak defoliator	Scrub oak	Serious defoliation
	Pinyon sawfly	Pinyon	Endemic
	Matsucoccus scale	Pinyon	Serious damage
Colorado N.M.	Pinyon sawfly	Pinyon	Endemic
	Matsucoccus scale	Pinyon	Serious damage
South Dakota			
Black Hills N.F.	Black Hills beetle	Ponderosa pine	840 trees
Wyoming			
Bighorn N.F.	Black Hills beetle	Ponderosa pine	1,900 trees

Table 2.--Forest Insect Control Projects in the Central Rocky Mountains and Great Plains--1953

General Area	Control Agency		Host		Control Method	Accomplishment
<u>Colorado-Engelmann Spruce Beetle</u>						
Arapaho N.F.	U.S. Forest Service		Engelmann spruce		ODB on standing trees	1,668 trees
					ODB on trap trees	2,113 trees
					ODB on stumps	700 stumps
					Trap trees felled	134 trees
White River N.F.	"	"	"	"	ODB on standing and trap trees	10,047 trees
					Trap trees felled	695 trees
Uncompahgre N.F.	"	"	"	"	ODB on standing trees	4,091 trees
San Juan N.F.	"	"	"	"	ODB on stumps, culls, and standing trees	18,000 units
Rio Grande N.F.	"	"	"	"	EDB on stumps and culls	436 units
<u>Colorado-Black Hills Beetle</u>						
Roosevelt N.F.	"	"	Ponderosa pine		EDB on standing trees	9,945 trees
Pike N.F.	"	"	"	"	EDB " " "	180 trees
San Isabel N.F.	"	"	"	"	ODB " " "	682 trees
Rio Grande N.F.	"	"	"	"	EDB " " "	459 trees
San Juan N.F.	"	"	"	"	ODB " " "	3,234 trees
Uncompahgre N.F.	"	"	"	"	EDB and ODB on standing trees	2,392 trees

Table 2.--Continued

General Area	Control Agency	Host	Control Method	Accomplishment
<u>Wyoming-Black Hills Beetle</u>				
Bighorn N.F., State of Wyoming, and private individuals	U. S. Forest Service and State of Wyoming	Ponderosa pine	EDB on standing trees	2,107 trees
<u>North Dakota-Black Hills Beetle</u>				
Black Hills N.F.	U. S. Forest Service	" "	ODB " " "	886 trees
Harney N.F.	" "	" "	" " " "	99 trees
<u>Miscellaneous</u>				
Colorado N.M.	U. S. Park Service	Pinyon sawfly on pinyon	DDT by mist blower	120 acres and 2 miles of roadside
Mesa Verde N.P.	" "	Pinyon sawfly on pinyon	" " " "	810 acres